# ▸In◂ ▸re◂ ▸Cohn◂

## (CCPA)
## 169 USPQ 95

**Decided Mar. 18, 1971**
**No. 8357**
**U.S. Court of Customs and Patent Appeals**

### Headnotes

**PATENTS**

**1. Claims - Indefinite - In general (§ 20.551)**

Claim language which expresses performing particular steps until a given result or state is reached, or a given condition obtrained, may be proper under third paragraph of 35 U.S.C. 112, but claims also must satisfy requirements of first and second paragraphs of section 112.

**2. Claims - Indefinite - In general (§ 20.551)**

**Construction of specification and claims - By specification and drawings - In general (§ 22.251)**

No claim may be read apart from and independent of supporting disclosure on which it is based; court must read claims in light of disclosure and in that light the term "opaque finish" as it appears in preamble of each claim must take on meaning ascribed to it in that disclosure; result is an inexplicable inconsistency within each claim requiring that rejection under 35 U.S.C. 112 on grounds of indefiniteness be sustained.

**Particular patents-Opaque Surfaces**

Cohn, Methods of Producing Opaque Surfaces on Aluminum, claims 12 to 14 of application refused.

**Case History and Disposition:**

Appeal from Board of Appeals of the Patent Office.

Application for patent of Charles C. Cohn, Serial No. 281,049, filed May 16, 1963; Patent Office Group 110. From decision rejecting claims 12 to 14, applicant appeals. Affirmed.

**Attorneys:**
Busser, Smith & Harding (George A. Smith of counsel) both of Philadelphia, Pa., for appellant.

S. Wm. Cochran (Leroy B. Randall and Raymond E. Martin of counsel) for Commissioner of Patents.

**Judge:**
Before Rich, Almond, Baldwin, and Lane, Associate Judges, and Re, Judge, United States Customs Court, sitting by designation.

**Opinion Text**

**Opinion By:**
Baldwin, Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the rejections of appellant's claim 12 under 35 U.S.C. 103 as obvious in view of prior art and of claims 12-14 as failing to comply with 35 U.S.C. 112, second paragraph.

## The Invention

The claims before us are directed to a method of producing non-metallic appearing finishes on aluminum surfaces. The specification details specific methods whereby various finishes may be obtained, "categorized according to their appearance as being frosted, opaque or glazed." In general, the methods comprise the three steps of forming an aluminum oxide layer on a pre-cleaned aluminum surface (anodizing), sealing that oxide layer with a selected sealant, and corroding the sealed surface under controlled conditions in order to produce a non-metallic appearing surface. The particular finish resulting-frosted, opaque, or glazed, porcelain-like-is a function of the particular sealant employed and, in the case of the "frosted" finish, the addition of an etching step subsequent to the cleaning of the surface. Claim 12 is illustrative of the particular method claimed:

> 12. The method of producing on a surface of aluminum a durable opaque finish comprising the steps of providing on the surface of the aluminum a porous oxide coating, then sealing said coating by treatment with a solution of an alkali silicate, and then treating the sealed surface with a corroding solution until the metallic appearance of the surface is supplanted by an opaque appearance.

Claim 13 is similar with caustic alkali specified as the corroding solution, while claim 14 adds an additional resealing step.

## The Section 112 Rejection

The issue we find determinative in this appeal is the correctness of the rejection of claims 12-14 as not satisfying the requirements of 35 U.S.C. 112. The examiner stated that the regarded those claims as "unduly broad and indefinite in failing to define the minimum time and temperature relationship of the corrosion treatment." He further thought that expressing the time period of the corrosion treatment in terms of obtaining the desired result of producing some "subjective", "relative and indefinite appearance", viz. an "opaque appearance", was particularly meaningless and indefinite, inasmuch as appellant, in his view, had not satisfactorily defined what constitutes a "metallic" appearance or an "opaque" appearance.

The board sustained the rejection "for the reasons given by the examiner," adding:

> We feel impelled also to comment that while the specification * * * lists as one essential step the formation of an aluminum oxide layer, no claim requires such a step. The oxide layer called for by the claims could be an oxide of any metal or non-metal e.g., lead, iron, phosphorus, etc., which further points up the essential correctness of the examiner's position.

Turning first to the above-quoted criticism of the board concerning the failure of the claims to recite that a porous *aluminum* oxide is formed on the aluminum surface, we agree with appellant that express inclusion of "aluminum" as a modifier of "oxide coating" is not necessary in the present circumstances. The evidence of record, notably the Tosterud [2] and Edwards [3] patents cited in support of the prior art rejection, amply establishes that the term "oxide coating", as it is employed in the claim, connotes an aluminum oxide coating to those in this art. [4]



The criticisms of the examiner, however, require further and deeper consideration. We have determined that while some of the points he raised are not sustainable, we are in agreement that the claims fail to define the subject matter sought to be patented with the particularity and distinctness required by the second paragraph of 35 U.S.C. 112.

In direct response to the rejection as framed by the examiner, appellant argues in his brief before us that his specification makes it clear that a wide variety of corrodants may be utilized in the "corrosion treatment" step of his process, and that the time and temperatures employed in that step may vary widely depending on the particular corrodant selected and its concentration. His position is that the broad claim language he has selected delineates clearly the full scope of his invention and is permitted by the third paragraph of 35 U.S.C. 112, which provides in pertinent part:

> An element in a claim for a combination may be expressed as a * * * step for performing a specified function without the recital of * * * material, or acts in support thereof, and such claim shall be construed to cover the corresponding * * * material, or acts described in the specification and equivalents thereof.

[1] It is true that claim language which expresses performing particular steps until a given result or state is reached, or a given condition obtained, *may* be proper under §112, third paragraph. This is with the proviso, however, that the claim otherwise satisfies the requirements of the first and second paragraphs of §112. See In re Lundberg, 44 CCPA 909, 244 F.2d 543, 113 USPQ 530 (1957); In re Arbeit, 41 CCPA 719, 206 F.2d 947, 99 USPQ 123 (1953). We might find appellant's arguments to be convincing if the sole issue were whether the instant claims were adequately supported under the requirements of the first paragraph. However, we cannot even reach that issue since we are not satisfied that these claims comply with the second paragraph of §112. Specifically, we are not sure that interested parties would be able to determine with adequate precision just what is the "opaque appearance" which indicates completion of the "corrosion treatment" step.

Initially, one might well wonder, as did the examiner, what distinction there is between a "metallic appearance" of a surface and an "opaque appearance" of that surface, particularly since metallic surfaces themselves are "opaque" at least in the usual sense of being non-transparent. In an affidavit filed below, the tenor of which is paraphrased in part in his brief here, appellant explains the intended significance of those terms:

> It is not possible to properly cover the full scope of the invention if any time-temperature relationship of the corrosion treatment is defined in the claims, since these parameters vary widely depending upon the corrosion agent employed, its concentration, temperature, etc. On the other hand, those skilled in the art of finishing aluminum would readily recognize when the metallic appearance of the surface being treated with a corroding solution is supplanted by an opaque appearance. The significance of "opaque appearance" being simply that the metallic appearing surface can no longer be seen which is readily evident by observation. A metallic appearance is readily recognized by those skilled in this art and is believed to be a clear term on its face.

When we turn to appellant's specification as permitted by the third paragraph of § 112, however, the matter does not appear so clear-cut or straight forward. The specification states:

> * * * the three steps set forth hereinabove ["forming" an oxide layer, "sealing" and "corroding"] produce a finish which is best described as being non-metallic and opaque but having a certain degree of luster. On the other hand, the above steps when combined with an etching step have been found to produce what may be described as a nonmetallic, frosted finish which lacks the luster of the opaque finish. Thirdly, a highly glazed or porcelain-like finish is also contemplated and it is to be understood that the production of this type of finish is dependent upon the particular sealant which is employed in the second step as will be described more fully hereinafter. * * *

After describing the particular oxide-forming techniques and explaining that various sealants may be employed, including alkali metal



silicates as well as certain acetates, the specification goes on to state:

> * * * the anodized and sealed surface produced by the above indicated steps presents a metallic appearing surface which is either highly reflective or slightly frosted in appearance depending upon whether the pretreatment included polishing or etching. However, during the corroding step, this finish is made opaque by the controlled corroding of the sealed coat. In the case of an aluminum alloy containing magnesium such as alloy No. 5357, this corroding tends to whiten the surface so as to create an opaque or glazed surface depending upon the particular sealant which is used as will be defined hereinafter. * * *

Appellant then describes the factors governing the choice of sealants:

> The second factor in determining the choice of seals and corrodents is governed by the particular type of finish which is desired. In this regard, it has already been pointed out that the types of finishes may be categorized according to their appearance as being frosted, opaque or glazed. In order to achieve the latter type, i.e. the glazed or porcelain-like finish, a silicate seal must be selected as the first sealant since the presence of silicon oxide is required for the formation of the glazed appearance. * * * In order to produce the frosted finish, the pre-treatment must include the etching step previously described although the type of seal which follows this step is not critical. Thus, the corrodent may be any of the previously mentioned corrodents provided that it is consistent with the selected type of seal having in mind the rules set forth as comprising the first factor of selection. Lastly, an opaque finish is achieved if the pre-treatment does not include an etching step and if the seal is other than a silicate seal. Thus, each of the above listed sealants may be considered as producing similar finishes insofar as the latter fall within the opaque classification.

In Example 1, appellant employs sodium silicate as a sealant to produce what he variously describes as a "whitened surface" or a "highly glazed finish, i.e., the enamel-like or porcelain-like finish having a white coloring." In Example 2, appellant employs nickel acetate as a sealant to produce an "opaque finish" not "quite as glossy" as the finish produced in Example 1, and appearing as a "flat paint rather than an enamel or porcelain" finish. In Example 3, a "frosted" finish is produced which is "neither porcelain-like or opaque as these terms have been defined hereinabove," and which is "not glossy" and does not have "the flatness of the opaque finish." Appellant's brief here asserts that Examples 1 and 3 "support all of the claims on appeal."

It is evident to us from the above summary of the description, definitions and examples appearing in appellant's specification, that the claims on appeal are inherently inconsistent. As used and defined in the specification, and unmodified by other terminology, an "opaque finish" is a flat-appearing finish which is *not* obtained when an alkali metal silicate is used as a sealant. Indeed, the latter sealant is said to produce a glazed or porcelain-like finish [5] having a white coloring. The claims, on the other hand, specifically call for sealing the oxide surface with an alkali silicate in order to ultimately obtain an "opaque appear-

[2] ance." No claim may be read apart from and independent of the supporting disclosure on which it is based. We are thus required to read the claims in light of the disclosure and in that light the term "opaque finish" as it appears in the preamble of each claim must take on the meaning ascribed to it in that disclosure. The result is an inexplicable inconsistency within each claim requiring that the rejection under 35 U.S.C. 112 on grounds of indefiniteness be sustained. We will not, therefore, discuss the other issues in the case.

The decision of the Board of Appeals is *affirmed.*

**Footnotes**

Footnote 1. Appearing in application serial No. 281,049, filed May 16, 1963 for "Methods of Producing Opaque Surfaces on Aluminum," as a continuation-in-part of serial No. 836,056, filed August 26, 1959.

Footnote 2. U. S. Patent 1,946,150, issued February 6, 1934.

Footnote 3. U. S. Patent 1,946,153, issued February 6, 1934.

Footnote 4. Tosterud states:

> The term "oxide coating" as used herein is a well known designation in the art to describe a layer of aluminum oxide artificially produced on the aluminum surface by chemical treatment, with or without the use of externally applied electrical energy, but the term does not include the thin film of aluminum oxide which is naturally formed upon the metal by contact with the air.

Similarly, Edwards states:

> By various known processes aluminum surfaces may be provided with what is generally termed an "oxide coating" Such a coating is composed in large part of aluminum oxide. * * *

Footnote 5. It is clear from the following dictionary definitions that glazed or porcelain surfaces are not necessarily, even ordinarily, opaque. Webster's New International Dictionary, 2nd Edition (1956) defines

> "porcelain" as "A fine ware differing from ordinary pottery in being translucent and in its superior whiteness * * *;
>
> "enamel" as "1. A vitreous composition, usually opaque or semiopaque, applied by fusion to the surface of metal * * * for protection or ornamentation. In ceramics, such a composition, when transparent, is usually called a glaze. 2. Any glossy surface resembling enamel;"
>
> "glaze" as "2. To incrust, cover, or overlay with a thin surface, consisting of, or resembling, glass * * * ; hence, to render smooth or glossy; * * *"; and
>
> "opaque" as "2. Not reflecting or giving out light; dark, not shining. 3. Impervious to the rays of light; not transparent."

**- End of Case -**

# ▸In◂ ▸re◂ ▸Barr◂, Williams, and Whitmore

## (CCPA)
## 170 USPQ 330

**Decided July 8, 1971**
**No. 8429**
**U.S. Court of Customs and Patent Appeals**

**Headnotes**

**PATENTS**

**1. Claims -- Indefinite -- In general (§ 20.551)**

Claims must be construed from standpoint of person skilled in relevant art in determining whether they comply with 35 U.S.C. 112 by particularly pointing out and distinctly claiming subject matter which applicants regard as their invention.

**2. Evidence -- Judicial notice (§ 36.20)**

Court does not use scientific journals as basis for taking judicial notice that controverted phrases are art-recognized because court is not sure that this fact is indisputable among reasonable men; however, these extra-record references may be used to bolster a weak point which is supported by some evidence in record even though court would decline to use them by themselves as basis for taking of judicial notice if there were no evidence at all in record in support of the point.

**3. Construction of specification and claims -- By specification and drawings -- In general (§ 22.251)**

**Construction of specification and claims -- Defining terms (§ 22.45)**

Disclosure may serve as dictionary for terms in claims; in such instances, disclosure may be used by court in interpreting claims and in determining their scope.



**4. Claims -- Functional -- In general (§ 20.451)**

In re Fuetterer, 138 USPQ 217, held that use of functional statements in claims to limit a class of chemical compounds used as one element of a composition of matter is sanctioned by third paragraph of 35 U.S.C. 112; although this case is not directly in point in instant situation because it dealt with a composition, not a compound, its rationale is controlling.

**5. Patentability -- Composition of matter (§ 51.30)**

All "compositions of matter" are "combinations" if they consist of two or more substances in some degree of corelationship.

**6. Patentability -- Aggregation or combination -- In general (§ 51.151)**

**Patentability -- Composition of matter (§ 51.30)**

Court declines to hold that combination is not patentable unless every element of combination could qualify as a patentable element, i.e., is statutory subject matter; categories of subject matter are set forth in 35 U.S.C. 101; chemical compounds are included as one kind of "composition of matter"; whether "elements" of chemical compounds are themselves statutory subject matter is irrelevant.

**7. Claims -- Functional -- In general (§ 20.451)**

Radical constituting element of claimed chemical compound is an element in claim for a combination within meaning of third paragraph of 35 U.S.C. 112.

**8. Claims -- Negative expressions (§ 20.75)**

Court reverses rejection of claims on ground that recital "incapable of forming a dye with said oxidized developing agent" is negative; claims comply with second paragraph of 35 U.S.C. 112 since boundaries of patent protection sought are set forth definitely, albeit negatively.

**9. Claims -- Indefinite -- In general (§ 20.551)**

Fact that claims encompass a large number of substances is no problem under second paragraph of 35 U.S.C. 112 so long as scope of claims is definite.

**10. Claims -- Functional -- In general (§ 20.451)**

**Claims -- Negative expressions (§ 20.75)**

Applicant may invoke third paragraph of 35 U.S.C. 112 to justify specification of one or more elements of claimed compound in functional terms; those functional terms may be negative; real issue is not whether recital is functional or negative, but whether it sets definite boundaries on patent protection sought, i.e., whether those skilled in relevant art can determine what claim does or does not read on.

**11. Specification -- Sufficiency of disclosure (§ 62.7)**

Disclosure of limited number of large group of chemicals is not necessarily sufficient basis for broad claims even though applicant makes general reference to group as a whole in specification.

**12. Court of Customs and Patent Appeals -- Briefs (§ 28.05)**

**Specification -- Sufficiency of disclosure (§ 62.7)**

While broad claims must necessarily read on many chemicals the operativeness of which applicant has not individually verified, and while it might have been reasonable for examiner or Board to have demanded specific proof from applicant that this or that class of compounds embraced by claims really could be used in disclosed manner, filing of solicitor's brief is too late a point in prosecution to inform applicant of what additional working examples are thought to be needed to support claims.

**13. Specification -- Sufficiency of disclosure (§ 62.7)**

Applicants have specifically disclosed how to make and use a large number of compounds and have asserted that other compounds, similar to compounds specifically disclosed in certain stated respects, may be made and used in same fashion; there is no reason to suspect that assertion is not accurate or that applicants are not pioneer inventors; useful purpose will not be served by extending lengthy application by inclusion of further working examples.

**14. Construction of specification and claims -- Defining terms (§ 22.45)**

Specification attempts no definition of claim language "a phenyl radical"; accord



ingly, court must presume that phrase was used in its commonly accepted technical sense.

**Particular patents--Photography**

Barr, Williams, and Whitmore, Photographic Elements and Processes Utilizing Mercaptan-Forming Couplers, claims 23, 24, 26 to 30, and 32 to 35 of application allowed; claim 25 refused.

**Case History and Disposition:**

Appeal from Board of Appeals of the Patent Office.

Application for patent of CharlesR. Barr, John Williams, and Keith E. Whitmore, Serial No. 507,975, filed June 14, 1965; Patent Office Group 120. From decision rejecting claims 23 to 30 and 32 to 35, applicants appeal. Affirmed as to claim 25; reversed as to claims 23, 24, 26 to 30, and 32 to 35; Almond, Judge, with whom Baldwin, Judge, joins, dissenting with opinion.

**Attorneys:**

JamesR. Frederick and Ogden H. Webster, both of Rochester, N. Y., for appellants.

S. Wm. Cochran (Raymond E. Martin of counsel) for Commissioner of Patents.

**Judge:**
Before Rich, Almond, Baldwin, and Lane, Associate Judges, and Durfee, Judge, United States Court of Claims, sitting by designation.

**Opinion Text**

**Opinion By:**
Rich, Judge.

This appeal is from the decision of the Patent Office Board of Appeals affirming the examiner's rejection of claims 23-30 and 32-35 in appellants' application entitled "Photographic Elements and Processes Utilizing Mercaptan-Forming Couplers," serial No. 507,975, filed June 14, 1965, a division of application serial No. 270,709, filed April 4, 1963, which matured into patent No. 3,227,554 on January 4, 1966. The appealed claims, all of which are for photographic color couplers, were "rejected as failing to define the invention properly, under 35 U.S.C. 112 * * *." Claim 36, for a single chemical compound, stands allowed. We affirm in part and reverse in part.

## The Invention

A "coupler" in this context is "a compound in a color-photography emulsion or developer solution that combines with the oxidized developer to form a dye." Webster's Third New International Dictionary (1966). The particular couplers here involved are of the general formula COUP-S-R wherein COUP is a coupler radical, S is a monothio radical (i.e., a sulfur atom) substituted in the coupling position of the COUP radical, and R is an organic radical. The essence of the invention is the use of the monothio radical to link known coupler radicals to certain other known organic radicals, resulting in the formation of diffusible mercaptans of the formula R-SH and photographic dyes when the coupler is reacted with a suitable developing agent. These mercaptans inhibit the growth of dye particles, increasing the sharpness of the resulting photograph. Allowed claim 36 recites a single chemical compound; the twelve claims on appeal recite classes of compounds, and it is the manner in which they do so which has led to this appeal.

We set forth claim 23, the broadest on appeal, as illustrative (subparagraphing supplied):

> 23. A photographic color coupler capable of forming a dye and a mercaptan when reacted with oxidized aromatic primary amino color developing agent and having the formula COUP-S-R wherein
>
> COUP is a photographic color coupler radical selected from the group consisting of a 5-pyrazolone coupler radical and an open-chain ketomethylene coupler radical,
>
> COUP having substituted in its coupling position the monothio radical; and
>
> R is an organic radical incapable of forming a dye with said oxidized developing agent and being selected from the group consisting of an alkyl radical, a cycloalkane radical, an aryl radical and a heterocyclic radical containing at least one hetero atom selected from the group consisting of oxygen, sulfur and nitrogen.

## The Rejection

No prior art is relied on.

The gist of the principal rejection, as expressed by the examiner, is that the claims "appear to read on vast numbers of compounds, whose only common feature is a thioether linkage." This fact, he wrote, renders the claims "so broad as to be virtually meaningless," thereby failing "to point out what applicants regard as their invention with the specificity required by 35 U.S.C. 112." Specifically, he said the terms "a 5-pyrazolone coupler radical" and "an open-chain ketomethylene coupler radical" (one or the other or both of which are used in every claim on appeal) render the claims "indefinite" because they read on "any substituted derivative" whereas "Only a relatively small, unrepresentative number of particular radicals falling within such terminology is supported by the specification." Similarly, the examiner stated that the terms "aryl," "al



kyl," and "heterocyclyl" (heterocyclic?) did not "meet the requirements of 35 U.S.C. 112," apparently on the ground that the use of such broad terms was not supported by the specification since he cited In re Sus, 49 CCPA 1301, 306 F.2d 494, 134 USPQ 301 (1962).

Additionally, the examiner held that the phrase "incapable of forming a dye with said oxidized developing agent" is "unduly functional at a point of novelty," that the terms "coupling position," "5-pyrazolone coupler radical," and "open-chain ketomethylene" were impermissibly "indefinite," and that "Appellants' use of `a phenyl' in claims 24, 25 and 30 involves a distortion of the term" because the specific radical recited in claim 25, which depends from claim 24, is not in fact a phenyl radical as that term is commonly understood.

The Board of Appeals affirmed all the examiner's rejections. Concerning whether use in the claims of the broad terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical" was supported by the specification, the board noted that appellants had disclosed thirty-seven specific examples of the former and forty specific examples of the latter but concluded that the specific examples given were not "sufficiently representative" of the "so-called classes * * * delineated by the claims * * *." The recitation of the R group it found similarly impermissible because it is "even broader" than the terminology used to delimit the photographic color coupler radicals.

Concerning the secondary rejections, the board held that "claims 23, 24, 26, 30, 31 and 32 do not identify the coupling position and this alone would render these claims indefinite and too broad," and the phrase "incapable of forming a dye with said oxidized developing agent" it found objectionable both for being "functional" and for being "negative." While it did not comment specifically on the examiner's other grounds of rejection, it did state that it found "no reversible error" in the examiner's rejection of all claims on the ground that the limitations placed by the claims on the COUP and R moeties were "so broad and indefinite that no definite or determinable group of compounds is set forth" and of claim 25 on the ground that it "amount[s] to a distortion of the term `phenyl radical' * * *."

## Opinion

This opinion is in five sections, the first three dealing with the general rejections for indefiniteness under the second paragraph of 35 U.S.C. 112, the fourth dealing with the rejections under the first paragraph of 35 U.S.C. 112, and the last dealing with the specific rejection of claim 25 under the second paragraph of 35 U.S.C. 112.

### *I. Are the terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical" indefinite?*

[1]To rephrase the question in terms of the statute, does the use in the claims of the terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical" cause the claims to fail in particularly pointing out and distinctly claiming the subject matter which appellants regard as their invention? To answer this question, the claims must be construed from the standpoint of a person skilled in the relevant art. In this regard we note (1) that each of the appealed claims is expressly directed to "photographic color couplers," (2) that the first paragraph of the specification states that "This invention relates to photography, and more particularly, to photographic elements and processes utilizing a new class of photographic color couplers," (3) that each object of the invention recited in the specification concerns the photographic art, and (4) that the only utility of the invention asserted in the specification and shown in the examples is in the photographic art. From all this we conclude that the specification, including the claims with which it concludes, is directed to those skilled in the photographic art and must be construed from the standpoint of a person skilled therein.

Appellants rely heavily on the fact that United States patents, including the patent which matured from the parent of this application, have issued containing the terminology now controverted. This they cite as evidence that "Patent Office Examiners skilled in photographic chemistry recognize that `5-pyrazolone' and `open-chain ketomethylene' constitute a distinct, identifiable group of color coupler radicals." [2]While we agree with the solicitor that these patents are not weighty



evidence of art recognition of the controverted terms "in the absence of proof, or even an allegation, that the patented files show that the `art-recognized group' issue was raised therein, and resolved in appellants' favor," [3]we note that neither the examiner nor the board gave any reason (for instance, the simple statement that they had never seen the terms used before and would like to see examples of their use in literature in the art) for their distrust of appellants' terminology.

Thus we are faced with appellants' fervent protestation that "Open-chain ketomethylene and 5-pyrazolone photographic color coupler radicals constitute distinct, identifiable groups of radicals recognized by those skilled in the photographic art," as evidence of which they have cited the use of those terms in the claims of two presumptively valid U. S. patents, [4]on the one hand, and the solicitor's equally fervent, but unsupported, protestation that "The [appellants'] contention regarding art recognized classes lacks merit" on the other. The solicitor has not directed our attention to any evidence in the record or any indication in generally accepted references in the art that a competent photographic chemist could not ascertain whether any given chemical did or did not contain either a 5-pyrazolone coupler radical or an open-chain ketomethylene coupler radical and therefore whether the appealed claims did or did not read on the given chemical to that extent, and what we find in what we take to be generally accepted references is to the contrary. We note, for instance, that in Vittum and Weissberger, The Chemistry of Dye-Forming Development, 2 Journal of Photographic Science 81 (1954), cited by appellants, the authors divide "nearly all" of the "diverse compounds" known to be useful as couplers into three groups: (a) open-chain methylene compounds, (b) cyclic methylene compounds, and (c) methine compounds. While Vittum and Weissberger do not specifically mention open-chain *keto* methylene couplers, we think it indisputable that, if photographic chemists would recognize open-chain methylene couplers in general, they would recognize open-chain ketomethylene couplers in particular. Similarly, while Vittum and Weissberger state only that "The most valuable couplers of this group [i.e., the cyclic methylene compounds] are the pyrazolones which are widely used as magenta couplers," we note that Kirk-Othmer, Encyclopedia of Chemical Technology (2d ed. 1968), Vol. 16 at 772, defines the 5-pyrazolone structure, and Vol. 5 at 824, in the article entitled "Color Photography," states that "The most important class of couplers for magenta dye formation are the derivatives of 5-pyrazolones," indicating that 5-pyrazolone color couplers are well known to the photographic art. [5]

In his brief on appeal, the solicitor argued the weakness of the appellants' proof and emphasized the breadth of appellants' claims. [6] While we have already noted that appellants' case might well have been much stronger (if, for instance, the affidavit which appears in the printed transcript but which is not a part of the official record because of the lateness of its submission had been submitted earlier), under the circumstances appellants have persuaded us that their claims are just as definite as a claim for "all compounds containing sulfur," a claim which might not be in compliance with the first paragraph of 35 U.S.C. 112, depending upon the disclosure contained in the specification, and which would certainly be too broad in the sense of 35 U.S.C. 103, but which would be fully in compliance with the second paragraph of section 112, assuming the applicant regarded his invention to consist of "all compounds containing sulfur." Accordingly, we cannot affirm the board's rejection on this ground.

### *II. Does the use of the term "coupling position" in the claims make them indefinite?*

Independent claims 23, 24, 26, 30, and 32 recite the COUP radical, then recite the substitution of the monothio radical S in "its



coupling position," and the other claims on appeal incorporate the "coupling position" recitation by operation of law. 35 U.S.C. 112, second paragraph, second sentence. According to the specification, it is "well known to those skilled in the photographic art" what "the coupling position" of COUP radicals of the type recited is. Specifically,

> The 5-pyrazolone coupler radicals couple at the carbon atom in the 4-position, * * * and the open-chain ketomethylene coupler radicals couple at the carbon atom forming the methylene moiety (e.g.,
> *Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*
> , *denoting the coupling position).

The examiner in his Answer, however, seems to have questioned the accuracy of the above assertion, stating that

> * * * most "5-pyrazolone" radicals and "open-chain ketomethylene" radicals have more than one "coupling position," and these are not necessarily in the positions designated * * *

and citing 4-4-dimethyl-3-(2-hydroxyphenyl)-5-pyrazolone as a compound which "might be `a 5-pyrazolone coupler radical' with the coupling position being the *5-position in the phenyl ring.* " (Emphasis in the original.) In affirming, the board stated that the failure of the claims to "identify the coupling position" was by itself sufficient to render them "indefinite and too broad." The claims would clearly be definite if, despite the lack of specific recitation of *the* coupling position in the claim, the recitation of "the coupling position" of a 5-pyrazolone coupler radical and of an open-chain ketomethylene coupler radical would be understood by those skilled in the photographic art to refer to the single, definite positions set forth in appellants' specification. This being so, we take it that the board must have (1) accepted the examiner's contention that there are a *plurality* of "coupling positions" on the recited COUP radicals, (2) read the claims as referring to a single, unspecified one of those "coupling positions," and (3) found that appellants had failed to "particularly point out" in their claims *at which* of the plurality of possible coupling positions the monothio radical was substituted in the particular photographic color couplers, thereby failing to point out what they regard as their invention.

[3]While we are mindful of our declaration in In re Prater, 56 CCPA 1381, 415 F.2d 1393, 162 USPQ 541 (1969), that this court, in contrast to a court adjudicating an infringement suit on an issued patent, will give "claims yet unpatented * * * the broadest reasonable interpretation consistent with the specification," id. at 1396, 415 F.2d at 1404, 162 USPQ at 550, it is also settled patent law that the disclosure may serve as a dictionary for terms appearing in the claims and that in such instances the disclosure may be used, even by this court, in interpreting the claims and in determining their scope. In re Vogel, 57 CCPA 920, 924, 422 F.2d 438, 441, 164 USPQ 619, 622 (1970). In our view, this is such a case, for the specificity with which appellants have set forth what they mean by the controverted phrases is the practical equivalent of a section in their specification headed "Lexicography." Even if it is true that "most `5-pyrazolone' radicals and `open-chain ketomethylene' radicals have more than one `coupling position'" in the general sense of that phrase, the portion of the specification quoted at the beginning of this section defines with great particularity precisely what *appellants* meant by the phrase. So interpreted, their claims do particularly point out and distinctly claim, so far as this issue is concerned, the subject matter which the appellants regard as their invention and therefore comply with the second paragraph of section 112.

## III. Does the use of the phrase "incapable of forming a dye with said oxidized developing agent" in the claims make them indefinite?

The board affirmed the examiner's rejection of all claims on the ground that the limitation "incapable of forming a dye with said oxidized developing agent" placed on the organic radical R is "negative and functional." On appeal, appellants argue that, since the claimed compounds are composed of known classes of radicals, these radicals can be specified in terms of their function without recitation of structure within the meaning of the third paragraph of 35 U.S.C. 112. [7]The solicitor, on the other hand, has argued that

> * * * paragraph 3 [of 35 U.S.C. 112] is applicable to a plural step process, a mechanical combination of elements, a plurality of compounds taken in combination (a composition), but not [to] a compound.

The gist of the solicitor's argument, as we understand it, is that the third paragraph of



section 112 refers only to combinations each element of which is itself patentable subject matter (i.e., which could be separately patented, subject to the conditions and requirements of Title 35) and that radicals are not patentable subject matter.

At the outset we note that it has not been argued that "functional" language in a claim is prohibited except as authorized by the permissive third paragraph of section 112. Indeed, the solicitor ends the portion of his brief on this point with the caveat that his arguments are

> * * * not to say that functional language could not be used in a claim to characterize any such "element" [i.e., "an `element' such as a chemical compound or a single integral [sic] mechanical component or element, such as a nail"] provided the claim otherwise satisfies the requirements of Section 112, paragraph 2.

However, appellants have expressly sought, and have been denied, "the benefit of the third paragraph of 35 U.S.C. 112," presenting for our determination an interesting extension of the issue before us in In re Fuetterer, 50 CCPA 1453, 319 F.2d 259, 138 USPQ 217 (1963).

[4]In the Fuetterer case we decided that the use of functional statements in claims to limit a class of chemical compounds (salts) used as one element of a composition of matter "is specifically sanctioned by the third paragraph of 35 U.S.C. 112." [8]As the solicitor points out, the case is not directly in point because it "dealt with a composition, not a compound." Nevertheless, we feel that its rationale, if not its holding, is controlling here. There the solicitor argued that "the last paragraph of 35 U.S.C. 112 is by its very language limited to claimed combinations involving mechanical structures or apparatus and methods," but we disagreed, noting our agreement with the statement in Federico's Commentary on the New Patent Act, 35 U.S.C.A. Vol. 1, p. 25 (1954), that the word "combination" in this paragraph *includes* "not only a combination of mechanical elements, but also a combination of substances in a composition claim, or steps in a process claim." Here the solicitor has expanded his argument just enough to concede the narrow holding of Fuetterer, and once again we are not persuaded that the clear words of the statute should be given so illiberal an interpretation.

[5]Speaking broadly but giving each of the disputed words their normal meaning, all "compositions of matter" are "combinations" if they consist of two or more substances in some degree of corelationship. The inorganic salts in Fuetterer were substances which occupied space and had mass, so they were matter, and they coacted with rubber, vulcanizing agent, reinforcing agent, protein, and/or carbohydrate to produce a desired result (improving the wet traction of tires), so the salts were held to constitute one element of a "combination" as that word is used in the third paragraph of section 112. Here, the controverted radicals are matter, for they too occupy space and have mass, and even more clearly than in Fuetterer they coact with the other two radicals recited to produce a desired result--namely, "A photographic color coupler capable of forming a dye and a mercaptan when reacted with oxidized aromatic primary amino color developing agent."

[6]The solicitor has argued that a combination is not patentable unless every element of the combination "could qualify as a patentable element" (i.e., is statutory subject matter). He has cited no authority for this proposition, and we decline to adopt it. In our view, the categories of statutory subject matter are set forth in 35 U.S.C. 101; chemical compounds are clearly included as one kind of "composition of matter"; and whether the "elements" of chemical compounds are themselves statutory subject matter we deem irrelevant to the question on appeal.

[7]Accordingly, we hold that a radical constituting an element of a claimed chemical compound is an "element in a claim for a combination" within the meaning of 35 U.S.C. 112, third paragraph.



[8]There remains for consideration the board's rejection of all claims on the ground that the recital "incapable of forming a dye with said oxidized developing agent" is "negative." [9]However, we feel that this rejection needs little comment in view of our decision in In re Wakefield, 57 CCPA 959, 422 F.2d 897, 164 USPQ 636 (1970), where we rejected a similar contention. Id. at 967, 422 F.2d at 904, 164 USPQ at 641. Again, the

[9]real "complaint seems to be that a very large number of substances are encompassed by the claims," and again we see no problem with that under the second paragraph of section 112, so long as the scope of the claim is definite. Here again the boundaries of the patent protection sought are set forth definitely, albeit negatively, and here again we hold that the challenged claim complies with the second paragraph of 112 in this respect.

[10]In summary, we hold that an applicant may invoke the third paragraph of section 112 to justify the specification of one or more elements of a claimed compound in "functional" terms, [10] and that those "functional" terms may be "negative." The real issue in any such case is not whether the recital is "functional" or "negative," but whether the recital sets definite boundaries on the patent protection sought--that is, whether those skilled in the relevant art can determine what the claim does or does not read on. Judged by this standard, we think it clear that the controverted language complies with the second paragraph of section 112.

## IV. Is the claim terminology supported by the specification?

All claims have been rejected on the ground that the terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical" and the various phrases used in specifying the R radical [11] are insufficiently supported in the specification--or, in the words of the statute, on the ground that the specification does not contain a written description of the manner of making and using the invention in such terms as to enable any person skilled in the photographic art to make and use the same. However, since it is not questioned that the specification teaches how to make and use at least certain embodiments of the invention, the question is really whether the applicants have enabled as broadly as they have claimed.

> Appellants stress that
>
> * * * working examples [contained in their specification] describe the preparation and use of molecules which contain 25 different 5-pyrazolone photographic color coupler radicals and 30 different openchain ketomethylene photographic color coupler radicals * * *

and that their

> * * * disclosure of specific useful "R" radicals includes 13 alkyl radicals, 1 cycloalkane radical, 8 aryl radicals, 122 heterocyclic radicals containing at least 1 nitrogen atom, 9 heterocyclic radicals containing at least 1 oxygen atom, and 17 heterocyclic radicals containing at least 1 sulfur atom.

The Board of Appeals recognized that appellants had disclosed a considerable number of examples of the various radicals in their specification, either directly by way of working examples or indirectly by way of incorporation by reference, but it nevertheless affirmed the examiner's rejection on this ground, noting that "the application of the fundamental

[11]principle * * * ["that disclosure of a limited number of a large group of chemicals is not necessarily sufficient basis for broad claims even though appellant has made general reference to the group as a whole in his specification"] `is necessarily a matter of judgment based on the circumstances of each case'." [12] While we agree with the quoted statement, we in turn note that our work would be immensely facilitated if the board (and the examiner, before a case reaches the board) would state the circum



stances of the case which have led it to judge that the limited number of chemicals specifically disclosed is not fairly representative of the large number of chemicals claimed. Specifically, if the board thought that appellants' working examples were deficient in some particular area or subclass embraced by the claim, there is no hint of that in its opinion.

The solicitor has attempted to remedy this deficiency in the record by setting forth at great length in his brief the multitudes of specific chemicals covered by appellants' claims which are *not* included among their working examples. [13]However, the solicitor has not suggested that there is any evidence in the record that any significant number of these multitudes of specific chemicals would not be "photographic color couplers capable of forming a dye and a mercaptan when reacted with oxidized aromatic primary amino color developing agent," nor has he argued that any significant group of compounds embraced by the claims are so obviously inoperative that we can take judicial notice of the fact.

[12]While we appreciate that claims as broad as appellants' must necessarily read on many chemicals the operativeness of which the applicant has not individually verified, and while it might well have been reasonable in this case for the examiner or the board to have demanded specific proof from the appellants that this or that class of compounds embraced by the claims really could be used in the disclosed manner, we think the filing of the solicitor's brief is far too late a point in prosecution to inform an applicant of what additional working examples are thought to be needed to support his claims.

> In any event, as this court recently stated,
>
> * * * there is no magical relation between the number of representative examples and the breadth of the claims; the number and variety of examples are irrelevant if the disclosure is "enabling" and sets forth the "best mode contemplated." [14][In re Borkowski, 57 CCPA 946, 952, 422 F.2d 904, 910, 164 USPQ 642, 646 (1970).]

[13]Appellants have specifically disclosed how to make and use a large number of compounds and have asserted that other compounds, similar to the compounds specifically disclosed in certain stated respects, may be made and used in the same fashion. We see no reason, on the state of this record, to suspect that their assertion is not accurate or that appellants are not the pioneer inventors they claim to be. Appellants' application runs to 132 pages in the transcript of record, and we are not persuaded that any useful purpose would have been served by extending it with further working examples. See In re Kamal, 55 CCPA 1409, 1413-14, 398 F.2d 867, 871, 158 USPQ 320, 323 (1968).

The rejection of all claims as unsupported by the specification is accordingly reversed.

## V. Does claim 25 fail to particularly point out and distinctly claim subject matter which appellants regard as their invention?

Claim 24 recites that R in the formula COUP-S-R "is a phenyl radical incapable of forming a dye with said oxidized developing agent." Claim 25 reads:

> 25. A photographic color coupler as described in claim 24 wherein the phenyl radical is a 3-octadecylcarbamylphenyl radical.

The examiner appears to have rejected claims 24, 25, and 30 (which is equivalent to claim 24 in this respect) on the ground that

> Appellants' use of "a phenyl" in claims 24, 25 and 30 involves a distortion of the term. The "phenyl radical" means the radical derived from benzene by removing one hydrogen atom, and cannot include as appellant is [sic] using it, a radical derived from N-octadecylbenzamide (See claim 25). Compare In re Hill, [34 CCPA 1062, 161 F.2d 367] 73 USPQ 482 [1947].

The board affirmed only the rejection of claim 25 on this ground.

In re Hill, cited in the above quotation, held that a definition in the specification of a term used in a claim which distorts the common meaning of the term is not permissible and renders the claim in which the term appears indefinite. This court there affirmed a rejection because the term "carbamide" was said by the Patent Office to mean the *single* substance urea whereas the claim used the phrase "a carbamide formaldehyde resin" to mean one of a *plurality* of resins formed from formaldehyde and urea derivatives and substituted ureas as well as urea itself. The court



found appellant had not established that such a meaning was proper.

[14]The specification in this case attempts no definition of the claim language "a phenyl radical." Accordingly, we must presume that the phrase was used in its commonly accepted technical sense. Appellants apparently concede as much, arguing that their "use of `phenyl' in claim 25 is similar to referring to `hydroxyphenyl'," which they assert is "standard practice" citing Hackh's Chemical Dictionary (3d ed. 1944). However, they have not referred us to any standard work on chemistry which indicates that the commonly accepted technical meaning of the words "a phenyl radical," without more, would encompass the hydroxyphenyl radical, or any other radical the name of which includes the word "phenyl." On the contrary, Hackh's quite plainly defines "phenyl" as " *The* monovalent radical, $C_6H_5$--, derived from benzene, $C_6H_6$, or phenol, $C_6H_5OH$." (Emphasis supplied.)

On the present record, therefore, we are faced with a claim for compounds containing a radical said simultaneously to be "a phenyl radical" and "a 3-octadecylcarbamylphenyl radical" and with the assertion of the Patent Office that the meaning of the phrase "a phenyl radical" is "confined to a single, definite radical" (to paraphrase the Hill case) not the 3-octadecylcarbamylphenyl radical, and we have been given no reason to doubt the Patent Office assertion. We therefore hold claim 25 indefinite and accordingly *affirm* its rejection under the second paragraph of 35 U.S.C. 112.

In summary, we *affirm* the rejection of claim 25 and *reverse* the rejection of claims 23, 24, 26-30, and 32-35.

## Footnotes

Footnote 1.

Claim 30 is equivalent to claim 24 in this respect.

Footnote 2. The present application was apparently assigned to a section of the Patent Office other than that to which the applications from which the patents relied upon were assigned, and both a letter of appellants to the examiner and appellants' brief before the Board of Appeals contain plaintive requests that the reader "consult any one of the expert photographic examiners in the photographic examining group" if he doubted appellants' assertion that 5-pyrazolone coupler radicals and openchain ketomethylene coupler radicals "are notoriously well known in the art."

Footnote 3. Moreover, both such patents which were properly in the record before the Patent Office and which are in the record before us were issued to appellants here and assigned to the real party in interest here, which suggests that the terms may be "art-recognized" only in appellants' own laboratory.

Footnote 4. U. S. Patent No. 3,227,551, and U. S. Patent No. 3,227,554, both issued Jan. 4, 1966, and assigned to Eastman Kodak Company.

Footnote 5. [2] 5 We do not use the above references as a basis for the taking of judicial notice that the controverted phrases are art-recognized (which would eliminate the need for our reliance on the two patents of record) because we are not sure that this fact is indisputable among reasonable men. McCormick on Evidence, § 324, p. 689 (1954). However, we are of the view that these extra-record references may be used to bolster a weak point which is supported by *some* evidence in the record even though we would decline to use them by themselves as a basis for the taking of judicial notice if there were *no* evidence at all in the record in support of the point. Cf. In re Boon, 58 CCPA ___, 439 F.2d 724, 727-28, 169 USPQ 231, 234 (1971).

Footnote 6. This latter argument we regard as beside the point, for there is no indication in the record that the appellants regard their invention as encompassing anything less than the broad field claimed.

Footnote 7.

35 U.S.C. 112, third paragraph, reads:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof.

Footnote 8. Only two judges joined the opinion of the court in Fuetterer. Two judges dissented, and one judge concurred "in result only," without opinion. However, the opinion of the dissenting judges argues that Fuetterer's *specification* failed to teach "which salts, other than the four disclosed, are capable of performing the desired function"; it does not suggest that functional expressions are per se inadequate to particularly point out and distinctly claim classes of compounds used as elements of compositions. Furthermore, both judges who dissented in Fuetterer joined the unanimous opinion in In re Boller, 51 CCPA 1484, 332 F.2d 382, 141 USPQ 740 (1964), a case in which the same panel of judges hearing Fuetterer reaffirmed the propriety of using functional language to describe one element in claims for a composition of resin, neutralizing agent, and water. Id. at 1488, 332 F.2d at 386, 141 USPQ at 742.

See also Locklin v. Switzer Bros., Inc., 299 F.2d 160, 165-66, 131 USPQ 294, 298-99 (9th Cir. 1961) (approving a product-by-process claim in which the amount of one reactant was described as "an amount * * * sufficient to render said condensation product substantially insoluable in aromatic hydrocarbon solvents but insufficient to render it thermosetting."), cert. denied, 369 U.S. 861, 133 USPQ 703 (1962).

Footnote 9. This rejection was contained in the first office action, but, after appellants responded that rejection on this ground "does not appear to be pertinent in view of the Commissioner's notice published May 10, 1965, 145 USPQ 6, page II," the examiner did not raise it again. Thus, it appears to have been a new ground of rejection when the board resurrected it in its opinion.

Footnote 10. At least where, as here, the functional language modifies known classes of radicals.

Footnote 11. Claim 23: "selected from the group consisting of an alkyl radical, a cycloalkane radical, an aryl radical and a heterocyclic radical containing at least one hetero atom selected from the group consisting of oxygen, sulfur and nitrogen."

Claims 24 and 30: "a phenyl radical."

Claim 25: "a 3-octadecylcarbamylphenyl radical."

Claims 26 and 32: "a heterocyclic radical having 1 to 4 hetero-nitrogen atoms."

Claims 27 and 34: "a 2-benzothiazolyl radical."

Claims 28 and 35: "a 5-phenyl-1,3,4-oxadiazolyl radical."

Claims 29 and 33: "a 1-phenyl-5-tetrazolyl radical."

Footnote 12. The bracketed quotation is from In re Oppenauer, 31 CCPA 1248, 143 F.2d 974, 62 USPQ 297 (1944); the terminal quotation is from Ex parte Heckert, 121 USPQ 587 (POBA 1958).

Footnote 13. For instance, we are informed that "not counting stereoisomers," the 20-carbon alkyl radical has 366,319 isomers, not all of which (or, to be fair, not a "representative sampling" of which) are included in appellants' working examples and that, "Among the more obvious radicals" which "could be substituted for hydrogen at the 1-position" of the 5-pyrazolone nucleus, but which are not included in any of appellants' working examples, are "amino, hydroxy, ester, carboxyl, sulfonyl per se, cycloalkyl, olefinic, actetylenic, heterocyclics, diazo, heavy metal-containing, etc." (Footnote omitted.)

Footnote 14. No question has been raised in this case concerning satisfaction of the "best mode" requirement.

## Dissenting Opinion Text

**Dissent By:**
Almond, Judge, dissenting, with whom Baldwin, Judge, joins.

I respectfully disagree with the conclusion reached by the majority in part I of its opinion. Unlike the majority, I would affirm the rejection of all claims under 35 U.S.C. 112, second paragraph. In my opinion appellants have not overcome the contention of the Patent Office that the terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical" are indefinite. Since I also find myself in disagreement with some of what is said in parts II-V of the majority opinion, I would affirm the decision of the board on this ground alone and not reach the issues discussed by the majority in parts II-V.

As pointed out in the majority opinion, we have here a situation where the Patent Office contends that certain chemical terms are indefinite and appellants contend they are not. Based on two United States Patents, cited by appellants for their use of the terms in question, and on two chemical texts which are not of record, the majority finds that the terms have a definite meaning to one of ordinary skill in the photographic art. In my opinion there is no real evidence of record to support this conclusion.

In regard to the two cited U. S. patents, I agree with the majority that "these patents are not weighty evidence of the art recognition of the controverted terms," since (1) there is no showing that the question of art recognition of the terms ever came up during the prosecution of these patent applications, and (2) both patents are assigned to the same assignee as the present application and were copending with the present application, which negates any presumption from the use of the terms in these patents that the terms are known to the art as a whole.

Since these two patents are not convincing of the art recognition of the controverted terms, there is no persuasive evidence before the court of the art recognition of those terms. The chemical texts cited in the majority opinion cannot aid appellants in this case. These texts are not of record and the majority has quite properly refused to take judicial notice of them. By considering the texts anyway, the majority has clearly gone beyond that which is authorized by 35 U.S.C. 144, which requires that this court "hear and determine * * * appeal[s] on the evidence produced before the Patent Office."

I think from the foregoing analysis that it is apparent that there remains the situation where one side argues that the terms are indefinite, the other side argues that they are not, and there is no persuasive evidence either way. Under the circumstances, I would place the burden on appellants to show that the terms in question have a definite art-recognized meaning. When an examiner rejects claims for indefiniteness under § 112 in situations such as this, it seems to me he is really saying what the majority evidently would like to have seen more explicitly spelled out, i.e., that he thinks the use of the terms makes the claims indefinite and would like to see examples of their use in literature in the art. An examiner can do little more since it is nearly impossible as a practical matter to show that the terms are indefinite. That is, an examiner cannot cite patents, textbooks, dictionaries, etc. to show that the terms are indefinite since the mere absence of the terms from the reference materials means little and if the terms are present in the reference materials, it would indicate some art recognition unless, perchance, the terms are listed with the nota



tion that they have no definite art-recognized meaning. On the other hand, the fact that the terms have a definite art-recognized meaning is much more easily shown. For example, literature references which use the terms can be cited, dictionary and encyclopedia definitions (such as those cited in the majority opinion) can be brought forth, and affidavits (such as the one tendered by appellants but not entered of record) can be submitted.

Therefore, when challenged as to the definiteness of the terms "5-pyrazolone coupler radical" and "open-chain ketomethylene coupler radical," I think it was incumbent upon appellants to show that the terms do have an art-recognized meaning. This they have clearly failed to do. As noted previously, the only evidence of record tending to show the art recognition of the terms is found in the two U. S. patents which were cited by appellants, and the relevancy of these patents has been questioned by everyone including the majority. Since there is no other evidence of record to support appellants' position, I do not think it proper for the court to do for appellants (by finding reference to the terms in chemical texts) that which they should have done for themselves. To do so requires reliance on material which is clearly outside of the record in this case and which is not subject to being judicially noticed. This is not permissible under 35 U.S.C. 144.

For the foregoing reasons, I would affirm the decision of the board.

**- End of Case -**

▸Hormone◂ ▸Research◂ ▸Foundation◂ Inc. v. Genentech Inc. (CA FC) 15 USPQ2d 1039

# ▸Hormone◂ ▸Research◂ ▸Foundation◂ Inc. v. Genentech Inc.

## U.S. Court of Appeals Federal Circuit
## 15 USPQ2d 1039

**Decided June 5, 1990**
**Nos. 89-1082, -1111**

**Headnotes**

**PATENTS**

**1. Patent construction - Claims - Defining terms (§ 125.1305)**

Federal district court correctly held that composition and method claims for synthetic human growth hormone having amino acid sequence and structure "corresponding" to that of particular drawing should be limited to material having exact structure and conformation depicted in drawing, even though court relied solely on dictionary definition without analyzing term's use in specification or prosecution history, since court's construction of term is nonetheless fully consistent with both specification and prosecution history.

**2. Infringement - Doctrine of equivalents - In general (§ 120.0701)**

**Infringement - Defenses - Prosecution history estoppel (§ 120.1105)**

Federal district court erred by granting summary judgment for defendant on ground that prosecution history estoppel precluded plaintiff's recovery for infringement under doctrine of equivalents, since meaning of arguments presented by patentee during prosecution in order to secure allowance of claims over prior reference is subject to more than single interpretation adopted by district court, and existence of disputed questions of fact regarding intent and meaning of such arguments therefore precludes summary judgment.

**3. Patentability/Validity - Adequacy of disclosure (§ 115.12)**

Federal district court erred by granting summary judgment that plaintiffs' claims for synthetic human growth hormone are invalid for lack of enabling disclosure, on ground that "solid phase peptide synthesis" process disclosed in specification would not have been sufficient to produce polypeptide sequences of required length, purity, or potency, since evidence that sequences of required length could be formed by disclosed method, while not necessarily sufficient to sustain ultimate holding of enablement, is sufficient to preclude summary judgment, and since it is not clear that defendants are "entitled to judgment as a matter of law" as required by Fed.R.Civ.P. 56(c), in that question of whether specification is enabling with respect to purity and/or potency of claimed materials is dependent on resolution of legal and factual issues not addressed by district court.

**Particular patents - Chemical - Synthetic hormones**

3,853,833, Li, synthetic human growth-promoting and lactogenic hormones and method or producing same, summary judgment holding claims 3, 11, 12, 17, 20, and 25 not literally infringed, affirmed; summary judgment holding those claims not infringed under doctrine of equivalents, vacated; summary judgment holding claims 1, 3, 11, 12, 17, 18, 20, and 25 invalid, vacated.

**Case History and Disposition:**



Appeal from the U.S. District Court for the Northern District of California, Patel, J.; 8 USPQ2d 1377.

Action by Hormone Research Foundation Inc. and Hoffman-LaRoche Inc. against Genentech Inc., Genentech Development Corp., and Genentech Clinical Partners Ltd., for patent infringement. From entry of summary judgment holding patent claims invalid and not infringed, and from denial of defendants' request for award of attorney's fees, parties cross-appeal. Affirmed in part, vacated in part, and remanded.

**Attorneys:**

S. Leslie Misrock, of Pennie & Edmonds (Gidon D. Stern, Stephen J. Harbulak, Thomas E. Friebel, and Jennifer Gordon, of counsel), New York, N.Y., for plaintiffs-appellants.

Coe A. Bloomberg, of Lyon & Lyon (Roland N. Smoot, James W. Geriak, Paul H. Meier, and Thomas J. Morgan, of counsel), Los Angeles, Calif., for defendants/cross-appellants.

**Judge:**

Before Cowen, senior circuit judge, Archer and Michel, circuit judges.

**Opinion Text**

**Opinion By:**

Archer, J.

Hormone Research Foundation and Hoffmann-LaRoche, Inc. (collectively HRF) appeal from the summary judgment of the United States District Court for the Northern District of California, *Hormone Research Found v. Genentech. Inc,* 708 F.Supp. 1096, 8 USPQ2d 1377 (N.D. Cal. 1988), holding (1) that Genentech, Inc., Genentech Development Corporation, and Genentech Clinical Partners, Ltd. (collectively Genentech) did not infringe claims 3, 11, 12, 17, 20, and 25 of U.S. Patent No. 3,853,833 ('833 patent), and (2) that claims 1, 3, 11, 12, 17, 18, 20, and 25 of that patent, which constitute all the claims in the suit, are invalid under 35 U.S.C. §112, first paragraph, for lack of enablement. Genentech cross-appeals from the denial of attorney fees and costs under 35 U.S.C. §285. We affirm-in-part, vacate-in-part and remand.

## *Background*

The facts underlying this appeal are set forth in the district court's opinion, *id,* and familiarity with that opinion is presumed. The facts may be summarized as follows.

In April, 1971, Dr. Chao Hao Li filed a patent application describing the production, via a process known as "solid phase peptide synthesis," of a synthetic, 188 amino acid sequence exhibiting growth promoting properties. According to the application, Dr. Li indicated that he had identified the structure of the natural human growth hormone (HGH). 1 However, in a continuation-in-part application that eventually matured into the '833 patent, Dr. Li conceded error in that regard and proposed a different version of the sequence of HGH, which is shown in Figure 2 of the '833 patent appended hereto. It is a 190 amino acid sequence.

It was later discovered and is admitted by HRF that the structure in Figure 2 of the '833 patent actually differs from natural HGH in two respects:

(1) HGH has one additional amino acid in the chain. (Specifically, glutamine is included at a position after the 68th amino acid.); and

(2) HGH has slightly different amino acids in positions 73, 106, and 108. (Spe



cifically, there is glutamic acid instead of glutamine at position 73, aspartic acid instead of asparagine at 106, and asparagine instead of aspartic acid at 108.)

Hormone Research Foundation is the current owner of the '833 patent and Hoffman-LaRoche has an exclusive license thereunder. Genentech produces, by a recombinant DNA method, a human growth hormone product it calls Protropin. The structure of Protropin differs from the structure identified in Figure 2 of the '833 patent in that Protropin contains 192 amino acids instead of 190. Specifically, Protropin has an additional methionine at the amino end of the sequence and, like natural HGH, it has an additional glutamine after position 68 and slightly different proteins in the positions corresponding to position 73 (glutamic acid rather then glutamine), 106 (aspartic acid instead of asparagine) and 108 (asparagine instead of aspartic acid).

Genentech has also produced Protropin II, which apparently has not yet been approved for marketing by the Federal Drug Administration. The parties do not dispute that Protropin II has a structure identical to that of natural HGH.

Believing that Genentech's activities relating to Protropin and Protropin II are in violation of its rights under the '833 patent, HRF filed suit against Genentech seeking both injunctive and monetary relief. The eight claims of the '833 patent asserted by HRF are:

1. A method of producing synthetic human pituitary growth hormone which comprises:

a. forming an unbridged polypeptide chain of amino acid residues in the sequence of natural human pituitary growth hormone;

b. generating sulfhydryl groups on the cysteine residues in said polypeptide chain;

c. oxidizing said sulfhydryl groups under conditions effective to form disulfide bridges between said cysteine residues, thereby forming two intramolecular rings in the polypeptide chain.

3. A method of producing a substance having growth-promoting activity which comprises:

a. forming an unbridged polypeptide chain of amino acid residues in a sequence corresponding to FIG. 2 or 3 of the accompanying drawing;

b. generating sulfhydryl groups on the cysteine resides in said polypeptide chain;

c. oxidizing said sulfhydryl groups under conditions effective to form disulfide bridges between said cysteine residues, thereby forming two intramolecular rings in the polypeptide chain.

11. A method of producing a substance having growth-promoting activity which comprises:

a. forming an unbridged polypeptide chain of amino acid residues in a sequence corresponding to (i) the portion of the sequence of FIG. 2 of the drawing from positions 86 to 190 or (ii) the said portion (i) combined with any fraction of the remaining portion from position 85 to position 1;

b. generating sulfyhdryl groups on the cysteine residues in said polypeptide chain;

c. oxidizing said sulfhydryl groups under conditions effective to form a disulfide bridge between said cysteine residues between said 181 and 188; thereby forming an intra-molecular ring in the polypeptide chain.

12. A composition of matter consisting essentially of a synthetic, biologically active substance which has a structure corresponding to FIG. 2 of the accompanying drawing.

17. A composition of matter consisting essentially of a synthetic, biologically active substance which has a structure corresponding to (a) the portion of the structure of FIG. 2 of the drawings from positions 86 to 190 or (b) the said portion (a) combined with any fraction of the remaining portion from position 85 to position 1.

18. A composition of matter produced in accordance with the method of claim 1.

20. A composition of matter produced in accordance with the method of claim 3.

25. A composition of matter produced in accordance with the method of claim 11.

Before the district court, Genentech filed three motions for summary judgment. 2 In its first motion, Genentech alleged that it had not infringed claims 3, 11, 12, 17, 20, and 25 of the '833 patent (the Figure 2 claims) because its Protropin products do not contain a compound having the structure of Figure 2. 3 In its second motion, Genentech



alleged that its products do not infringe claims 1, 3, 11, 18, 20, and 25 because they are produced by a recombinant DNA technique which differs from the solid-phase peptide process covered by these claims. In its final motion, Genentech asserted that the '833 patent claims at issue were invalid because the specification failed to satisfy the enablement requirement of 35 U.S.C. §112, first paragraph. 4 The district court granted Genentech's first and third motions, but denied the second.

With regard to Genentech's first motion, the district court found that the Figure 2 claims were not literally infringed because Genentech's products do not "correspond" to the structure of Figure 2. The district court also concluded that prosecution history estoppel precludes HRF from recovering for infringement under the doctrine of equivalents. On the enablement motion, the district court held that the specification would not have enabled a person skilled in the art to make and use either HGH (claims 1 and 18) or the structure of Figure 2 (claims 3, 11, 12, 17, 20, and 25) because, in its view, the synthesis process disclosed in the specification would not produce the identical polypeptide sequences called for in these claims.

Genentech also filed a motion for attorney fees and costs under 35 U.S.C. §285, which the district court denied on the basis that Genentech had not shown that such an award was warranted. 5

In this appeal, HRF contends that:

(1) The district court erred in concluding on summary judgment that there was no literal infringement of claims 3, 11, 12, 17, 20, and 25 of the '833 patent.

(2) The district court erred in concluding on summary judgment that prosecution history estoppel precludes a finding of infringement of the Figure 2 claims under the doctrine of equivalents.

(3) The district court erred in concluding on summary judgment that claims 1, 3, 11, 12, 17, 18, 20, and 25 of the '833 patent were invalid under 35 U.S.C. §112, first paragraph, for lack of enablement. 6

In its cross appeal, Genentech asserts that:

(4) The district court erred in denying it an award of attorney fees and costs under 35 U.S.C. §285.

## *OPINION*

### I. *Summary Judgment*

Under Rule 56(c) of the Federal Rules of Civil Procedure, summary judgment "shall be rendered if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show there is no genuine issue of material fact and the moving party is entitled to a judgment as a matter of law." *See Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247 (1986). "In reviewing a district court's grant of summary judgment in a patent case, this court must ... determine for itself whether the evidence is genuinely conflicting on the material issues of fact and, if not, whether the movant is entitled to judgment on those facts." *Avia Group Int'l, Inc. v. L.A. Gear Cal.*, 853 F.2d 1557, 1561, 7 USPQ2d 1548, 1551 (Fed. Cir. 1988).

We conclude that the district court properly granted summary judgment to resolve literal infringement where the controlling issue was solely one of law. On the other appealed issues, however, summary judgment was inappropriate.

## II. *Literal Infringement*

The determination of whether a patent claim has been literally infringed involves two inquiries: whether the claims have been properly interpreted to determine their scope, and whether each limitation of the properly construed claims is found in the accused product or process. *See ZMI v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1578, 6 USPQ2d 1557, 1559 (Fed. Cir. 1988). The first of these is a legal question and the second is factual. *Id.* ; *Loctite Corp.*



*v. Ultraseal Ltd.*, 781 F.2d 861, 866, 228 USPQ 90, 93 (Fed. Cir. 1988).

In the present case there is no dispute regarding either the chemical structure or the conformation of the accused products; neither have the identical structure and conformation of Figure 2. Since the district court interpreted the Figure 2 claims as limited to a material having a structure and conformation identical to that depicted in Figure 2 of the patent, it held that Genentech's products do not literally infringe the claims. Consequently, the issue of whether Genentech's products literally infringe the '833 claims at issue is dependent solely on whether the district court's claim interpretation was legally correct. *See Loctite,* 781 F.2d at 865-66, 228 USPQ at 92. Our review of this legal question is *de novo.*

Claim interpretation involves a review of the specification, the prosecution history, the claims (including unasserted as well as asserted claims), and, if necessary, other extrinsic evidence, such as expert testimony. *See Senmed, Inc. v. Richard-Allan Medical Indus.*, 888 F.2d 815, 818-19, 12 USPQ2d 1508, 1511-12 (Fed. Cir. 1989); *see also Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 1569-70, 219 USPQ 1137, 1140-41 (Fed. Cir. 1983). Should there exist a genuine dispute concerning any underlying factual matters, summary judgment on the infringement issue would be inappropriate. Fed. R. Civ. Proc. 56(c); *see generally Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1054, 5 USPQ2d 1434, 1441 (Fed. Cir. 1988).

In the present case, the district court interpreted the term "corresponding," 7 as used in the Figure 2 claims to refer to the polypeptide sequence depicted in Figure 2 of the '833 patent and determined that the claims should be limited to the identical amino acid sequence and conformation there depicted. The court based that determination on its view of the most applicable dictionary definition of "corresponding," 8 without discussing or acknowledging how that term was used in the specification and prosecution history.

HRF asserts that the district court's interpretation of the claims was in error not only because the specification and prosecution history were seemingly ignored but also because the court focused on the wrong dictionary definition of the disputed term. HRF contends that the claims should be interpreted broadly to encompass materials, such as Genentech's Protropin products, which have a structure and conformation "similar" to that shown in Figure 2 of the '833 patent.

[1] Although the district court's methodology in interpreting the claims may have been incorrect, we are not persuaded that the district court reached an erroneous claim construction. It is a well-established axiom in patent law that a patentee is free to be his or her own lexicographer, *see Fromson,* 720 F.2d at 1569, 219 USPQ at 1140, and thus may use terms in a manner contrary to or inconsistent with one or more of their ordinary meanings. For this reason, an analysis of the specification and prosecution history is important to proper claim construction. Here, however, the court's determination that the claim phrases "a sequence corresponding to Figure 2" and "a structure corresponding to Fig. 2" required identity in all respects to that drawing is fully consistent with both the specification and the prosecution history.

In the specification, the patentee stated:

The molecular structure illustrated in FIG. 1 was thought heretofore in the art *to correspond* to that of natural HGH, but as indicated earlier hereinabove, applicant has discovered that this is not correct. The correct structure of HGH has been determined by applicant and is illustrated in FIG. 2. It consists of a polypeptide chain of 190 amino acid residues, as compared to 188 amino acid residues in the polypeptide chain in FIG. 1.

....

hile there is *general similarity* between the overall conformations and structures illustrated in FIGS. 1 and 2, there are differences in the number and sequence of amino acid residues and in the size of the layer of the two intramolecular rings present in both structures.

'833 patent specification, col. 4, l. 55 - col. 5, l. 12 (emphasis added). This strongly suggests that the terms "correspond" and "similar[]" were not intended by the patentee to have the same meaning and that the former reflected true identity.

More convincing, however, are the statements made during the prosecution of the application for the '833 patent. There patentee described claim 12, which uses the phrase "a structure corresponding to Fig. 2," as



"directed solely to the compound of Fig. 2," "specific to the structure of Fig[]. 2," "limited to the structure[] shown in the drawing" and "specific to the chemical formula of Fig. 2." Each of these descriptions pointedly evinces the patentee's use of the term "corresponding" in the narrow sense of requiring identity rather than "similarity."

In sum, we conclude that the district court correctly held, albeit on the basis of an incomplete analysis, that the term "corresponding" as used in the disputed phrases of the '833 patent claims limits all of the Figure 2 claims to a material having the exact structure and conformation shown in Figure 2 of the '833 patent. *Stratoflex, Inc. v. Aeroquip Corp.,* 713 F.2d 1530, 1540, 218 USPQ 871, 880 (Fed. Cir. 1983) ("We sit to review judgments, not opinions."). HRF's arguments to the contrary are little more than a post-hoc attempt to redefine its claims during litigation. This it cannot do. *See Senmed,* 888 F.2d at 819 n.8, 12 USPQ2d at 1512 n.8. Accordingly, that part of the district court's judgment that Genentech's products do not literally infringe claims 3, 11, 12, 17, 20, and 25 of the '833 patent is affirmed.

## III. *Infringement under the Doctrine of Equivalents*

Infringement under the doctrine of equivalents is an equitable doctrine intended, "in situations where there is no literal infringement but liability is nevertheless appropriate[,] to prevent what is in essence a pirating of the patentee's invention." *Loctite,* 781 F.2d at 870, 228 USPQ at 96. Under the doctrine of equivalents, the accused products and processes may infringe the '833 patent claims if they perform substantially the same function in substantially the same way to give substantially the same result. *Id.* The doctrine of equivalents, however, is not a tool for redrafting the claims of a patent. *Senmed,* 888 F.2d at 818, 12 USPQ2d at 1511.

Prosecution history estoppel is a judicially accepted limitation to the doctrine of equivalents. Under that limitation, a patentee cannot "recapture through equivalence certain coverage given up [by argument or amendment] during prosecution." *Loctite,* 781 F.2d at 870, 228 USPQ at 96. This is not to say, however, that, whenever a limiting amendment or argument is made during prosecution, the patentee loses all coverage between what the claims literally cover and what they would have covered prior to the amendment or argument. Such an approach was rejected in *Hughes Aircraft Co. v. United States,* 717 F.2d 1351, 1362-63, 219 USPQ 473, 481 (Fed. Cir. 1983). Instead, "[d]epending on the nature and purpose of an amendment, it may have a limiting effect within a spectrum ranging from great to small to zero." *Id.*

"[W]henever the doctrine is evoked, 'a close examination must be made as to, not only what was surrendered, but also the reason for such a surrender.'" *Loctite,* 781 F.2d at 871, 228 USPQ at 96 (quoting *Bayer Aktiengesellschaft v. Duphar Int'l Research,* 738 F.2d 1237, 1243, 222 USPQ 649, 653 (Fed. Cir. 1984)). Thus, the scope of estoppel can depend on factual questions regarding the prosecution history, which may be disputed and preclude a disposition of the issue on summary judgment. That is the situation here. *Cf. Howes v. Medical Components, Inc.,* 814 F.2d 638, 646, 2 USPQ2d 1271, 1275-76 (Fed. Cir. 1987) ("Summary judgment should not have been granted" where there are "too many unresolved fact issues to properly construe the scope of [the] claims."); *Palumbo v. Don-Joy Co.,* 762 F.2d 969, 976, 226 USPQ 5, 10 (Fed. Cir. 1985) ("[I]f ambiguity is thought to surround the prosecution history in this case, that could give rise to a question of fact underlying the legal question of claim construction.").

In the present case, the district court did not decide the issue of whether the accused products or processes were equivalent to the claimed invention. Instead, it held that recovery under the doctrine of equivalents was precluded by prosecution history estoppel. The relevant prosecution history pertains to application claim 18 (A-claim 18), which ultimately issued as claim 15 of the '833 patent. Even though A-claim 18 is not at issue in the case, its prosecution history formed the basis of the estoppel found by the district court. 9 A-claim 18 reads:

18. A composition according to claim 12 without the disulfide bridges shown in the drawing and substituted instead with te



tra-S-carbamidomethyl groups on the cysteine residues thereof.

In his first action on the application, the patent examiner rejected A-claim 18 (which at that time covered Figures 1, 2 and 3) under 35 U.S.C. §102(b) 10 as anticipated by the Bewley, et al. article (Bewley or reference U). Bewley discloses natural HGH substituted in the same manner as the composition described in A-claim 18, *i.e.,* where the disulfide bridges depicted in the Figure 2 structure of the '833 patent are substituted with tetra-S-carbamidomethyl groups. The applicant (now pantentee) responded by stressing that Bewley did not disclose how to make synthetic HGH, the starting material needed to make the claimed invention:

The reference U discloses a reduced carbamidomethylated HGH. However, claim 18 is dependent from claim 12 which calls for "A composition of matter consisting essentially of a synthetic, biologically active substance...." The reference U shows no way of producing the basic compound required as shown in Figs. 1, 2, or 3 which is necessary starting material for the carbamidomethylated derivative.

Still not convinced that A-claim 18 was patentable, the examiner again rejected it as anticipated by Bewley. He stated that "[t]he reference uses native hormone as starting material and in rejecting the instant claim the preamble 'synthetic ... substance ...' is given no patentable weight."

In response to this continued rejection, the applicant stated:

The Examiner has rejected claim 18 under 35 U.S.C. 102(b) as anticipated by Bewley et al (U). Claim 18 is dependent from allowed claim 12, which until this amendment was directed to the compounds of Fig. 1, 2 or 3. Presently, claim 12 is directed solely to the compound of Fig. 2. Newly presented claim 29 is directed solely to the compound of Fig. 3. There is no claim directed solely to the compound of Fig. 1. New claim 32 is dependent from claim 29 but is otherwise like claim 18.

The Bewley et al (U) reference discloses the carbamidomethylated reduced HGH - or so the reference asserts - the reference does not, however, disclose the chemical structure of the asserted HGH, which is the starting compound. Claim [] 18 ... depend[s] ... from claim[ ] 12 ..., which [is] specific to the structure of Fig[]. 2 .... *The claims are therefore limited to the structures shown in the drawings and are not directed broadly to HGH or its derivatives.* No such structure is disclosed in the reference U. As such, the reference does not show the basic compound which must be reduced to achieve the derivative claimed in these claims. Indeed, the authors of reference U, while they refer to HGH and were in fact working with natural pituitaries, clearly did not know the structure. One of the authors of the article U was Dr. Li, the inventor in the present case. He, and one of the other authors, Jonathan S. Dixon, were also co-authors of the later publication T which asserts that the structure of Fig. 1 is in fact HGH. As stated in the specification herein at page 2, lines 9-11, the published formula of Fig. 1 does not in fact correspond to natural human pituitary growth hormone. This was learned only subsequent to the date of publication T. Accordingly, the publication U, earlier in time, cannot anticipate the formulas of the present figures since they were not then known. Inasmuch as *these product claims are specific to the chemical formula of Fig. 2 or Fig. 3, and the reference does not show the same,* and, further, that the record demonstrates the formula was not in fact known, these claims are clearly allowable. (Emphasis added).

The examiner then allowed A-claim 18.

[2] In the district court's view, the underlined portion of the above excerpt was key to its estoppel holding. The opinion states:

The applicant has thus secured the patentability of A-claim 18 by arguing that the structural limitation in A-claim 12 was directed narrowly to Fig. 2 rather than broadly to HGH or its derivatives. The argument was successfully made to disclaim coverage of a substance, disclosed in the Bewley reference, where starting material had a structure identical to the structure of natural HGH. Plaintiffs now argue, however, that the same structural limitation in A-claim 12, which issued without further amendment as patent claim 12, should be expanded 11 by the



doctrine of equivalents to include a substance having a structure identical to that of natural HGH (or, in the case of Protropin, natural HGH with an additional terminal methionine) but not identical to Fig. 2. The doctrine of prosecution history estoppel prevents plaintiffs from recovering through the doctrine of equivalents subject matter surrendered during prosecution of the patent.

708 F.Supp. at 1105-06. To the district court, therefore, what transpired during prosecution of the '833 patent was believed to be clear. The district court interpreted Dr. Li's argument that the claims are "limited to the structures shown in the drawings and are not directed broadly to HGH or its derivatives" to mean that the pending claims were confined to the specific structure of Figure 2 and that the Bewley reference was not anticipatory because it depicted the different, although very close, structure of natural HGH. If it were clear that this was the intended meaning of Dr. Li's arguments, the district court's determination that the prosecution history precludes HRF from recovering under the doctrine of equivalents would be correct.

There are, however, other possible interpretations of Dr. Li's prosecution arguments. HRF suggests that because the starting material for producing the carbamidomethylated derivative of A-claim 18 was the *synthetic* hormone of Figure 2 (believed at that time by Dr. Li to be the same structure as natural HGH), whereas the starting material disclosed by Bewley was *natural* HGH, the patentee surrendered only carbamidomethylated substitutes derived from *natural* HGH. 12 This interpretation, unlike the one accepted by the district court, is consistent with the view expressed throughout the '833 specification that the structure of Figure 2 and natural HGH were one and the same.

Another plausible interpretation of Dr. Li's argument is based upon his statements to the examiner that "[n]o such structure is disclosed in the reference U" and "[a]s such, the reference does not show the basic compound which must be released to achieve the derivative claimed in these claims." He further argued that "publication U ... cannot anticipate the formulas of the present figures since they were not then known." Drawing all inferences in favor of HRF, which summary judgment requires, *see, e.g., Avia Group Int'l, Inc. v. L.A. Gear Cal.*, 853 F.2d 1557, 1560, 7 USPQ2d 1548, 1550, Dr. Li may have been suggesting that Bewley was not anticipatory of the rejected claims because it was not enabling under 35 U.S.C. §112, since it did not disclose a structure of, or how to make, HGH. 13 *See Akzo N.V. v. United States Int'l Trade Comm'n*, 808 F.2d 1471, 1479, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986).

Accordingly, we cannot say that the meaning of Dr. Li's prosecution arguments is without ambiguity and that there are not unresolved factual questions regarding the intent of those arguments. The other possible interpretations of Dr. Li's prosecution arguments are very relevant to the proper application of prosecution history estoppel as a limitation to infringement under the doctrine of equivalents. The existence of disputed factual questions regarding the intent and meaning of the prosecution arguments precludes summary judgment.

Accordingly, we vacate that part of the judgment which held that the claims are not infringed under the doctrine of equivalents and remand the case to the district court to determine the intent and effect of the arguments made during the prosecution of A-claim 18. 14

## IV. *Enablement*

The district court's summary judgment that claims 1, 3, 11, 12, 17, 18, 20, and 25 are invalid for lack of an enabling disclosure, *see* 35 U.S.C. §112, 1st para., was also improvi



dently granted. 15 The court granted Genentech's motion because, in its view, the solid phase peptide synthesis process disclosed in the specification would not have been sufficient to produce materials as lengthy as the claimed polypeptide sequence or in a pure form and having the potency of natural HGH.

"To be enabling under §112, a patent specification must disclose sufficient information to enable those skilled in the art to make and use the claimed invention." *Spectra-Physics v. Coherent,* 827 F.2d 1524, 1533, 3 USPQ2d 1737, 1743 (Fed. Cir. 1987). "Although enablement is ultimately a question of law, this court has recognized that there may be underlying factual issues involved." *Id.* ( *citing Moleculon Research Corp. v. CBS, Inc.,* 793 F.2d 1261, 1268, 229 USPQ 805, 810 (Fed. Cir. 1986), and *Quaker City Gear Works, Inc. v. Skil Corp.,* 749 F.2d 1446, 1453-54, 223 USPQ 1161, 1166 (Fed. Cir. 1984)).

[3] After reviewing the record and the district court's lengthy analysis of the evidence submitted by Genentech, we are convinced that the enablement question in this case should not have been resolved summarily. Although the district court indicated that Genentech produced considerable evidence tending to show that the disclosed sequencing method could not have yielded polypeptide sequences as lengthy as that of Figure 2 (190 amino acids), other evidence in the record raises a genuine issue about this material fact. The '833 specification itself discloses that Dr. Li's claimed method had produced the material depicted in Figure 1 of the '833 patent and that such a material exhibited lactogenic activity. Evidence tending to support this assertion can be found in several of the journal articles in the record. For example, *see* C. H. Li and D. Yamashiro, "The Synthesis of a Protein Possessing Growth-Promoting and Lactogenic Activities," J. Amer. Chem. Soc., *92* (26), 7608-9 (1970); H.D. Niall, "The Chemistry of the Human Lactogenic Hormones," p. 14; *Prolactin and Carcinogenesis, Proceedings of the Fourth Tenovus Workshop, Cardiff March 1972,* Alpha Omega Alpha Publishing, Cardiff, Wales, U.K. (August 1972); C. H. Li, "Human Pituitary Growth Hormone," *Clinical Orthopedics and Related Research, 89,* 123 (Nov-Dec 1972). While this evidence may not be sufficient to sustain an ultimate holding of enablement, it does, giving all inferences to HRF, *see* Fed. R. Civ. Proc. 56, preclude a summary judgment that the '833 claims are invalid on the basis that sequences of the required length could not be formed by the disclosed method.

In addition, we are unconvinced that Genentech "is entitled to a judgment as a matter of law." Fed. R. Civ. Proc. 56(c). Whether the specification of the '833 patent is enabling with respect to the purity and/or potency of the claimed materials is dependent on the resolution of legal and factual issues not addressed by the district court. Although the district court applied the principles set forth in *In re Fisher,* 427 F.2d 833, 166 USPQ 18 (CCPA 1970), it did not in its analysis consider the effect of *In re Hogan,* 559 F.2d 595, 194 USPQ 527 (CCPA 1977), *see also United States Steel Corp. v. Phillips Petroleum Co.,* 865 F.2d 1247, 1251, 9 USPQ2d 1461, 1464 (Fed. Cir. 1989), on the resolution of the enablement issues. In *In re Hogan,* the court stated:

Appellants disclosed, as the only then existing way to make such a polymer, a method of making the crystalline form. To now say that appellants should have disclosed in 1953 [original filing date] the amorphous form which on this record did not exist until 1962, would be to impose an impossible burden on inventors and thus on the patent system. There cannot, in an effective patent system, be such a burden placed on the right to broad claims. To restrict appellants to the crystalline form



disclosed, under such circumstances, would be a poor way to stimulate invention, and particularly to discourage its early disclosure.

559 F.2d at 601-606, 194 USPQ at 533-57. *Accord United States Steel,* 865 F.2d at 1249-52, 9 USPQ2d at 1463-66.

The opinion in *In re Hogan* specifically commented on *In re Fisher:*

this court set forth the basic considerations respecting enablement and the potential for domination of future developments, describing the effect of predictability factors upon those considerations. We adhere to what was there said concerning the high level of predictability in mechanical or electrical environments and the lower level of predictability expected in chemical reactions and physiological activity. With respect to the erroneous use of a later state of the art in determining enablement, however, we make no distinction between fields of invention.

559 F.2d at 606, 194 USPQ at 537-38. Merely because purer and more potent forms of the Figure 2 compound might be produced using later-discovered technology does not necessarily mean that the '833 patent specification did not provide sufficient enabling disclosures as of the filing date of the application.

It is unclear whether the high degree of potency and purity contemplated by the district court's analysis of enablement was influenced by the potency and purity obtainable through recombinant DNA methodology. Moreover, it is unclear from the record before us whether that technology existed at the time the application was filed. Further factual development as to the state of the art at the date of the application, and consideration of *In re Hogan* by the district court, is required for this court to review these enablement issues.

That part of the summary judgment holding the asserted claims of the '833 patent to be invalid is, therefore, vacated.

## V. *Attorney Fees*

The district court denied Genentech's motion for attorney fees and costs. As the then prevailing party, Genentech was entitled to make that motion, but in view of our decision it does not now have that status. Accordingly, Genentech's cross-appeal for attorney fees under 35 U.S.C. §285 is dismissed, without prejudice. If Genentech prevails on remand, it may renew its motion at that time.

## VI. *Conclusion*

We affirm the district court's judgment insofar as it determined that Genentech did not literally infringe the asserted claims. However, we conclude that there are genuine issues of material fact underlying the issues of prosecution history estoppel and enablement. We therefore vacate the district court's summary judgment of noninfringement of claims 3, 11, 12, 17, 20 and 25 and of invalidity of claims 1, 3, 11, 12, 17, 18, 20, and 25 and remand the case for further proceedings consistent with this opinion.

## COSTS

Each party shall bear its own costs.

*AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED*

## APPENDIX

### Footnotes

Footnote 1. Naturally occurring human growth hormone (HGH) is produced by the human pituitary gland and is useful in the treatment of human growth hormone deficiencies. Until a method was discovered for the synthetic production of HGH, it could only be obtained by extraction from the pituitary glands of human cadavers.

Footnote 2. HRF opposed each of these motions and filed cross-motions for summary judgment on the same issues. Each of these cross-motions were denied by the district court.

Footnote 3. Though claims 3 and 20 also read on Figure 3 of the patent, HRF has made no allegation that Genentech's products infringe these claims on that basis.

Footnote 4. That first paragraph of 35 U.S.C. §112 states:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Footnote 5. Section 285 states that "[t]he court in exceptional cases may award reasonable attorney fees to the prevailing party."

Footnote 6. As the text shows, infringement, both literal and under the doctrine of equivalents, involves only claims 3, 11, 12, 17, 20 and 25, which were the subject of Genentech's first motion for summary judgment. The district court denied Genentech's motion for summary judgment that claims 1 and 18 were not infringed, but these claims were held invalid.

Footnote 7. Interpreting a term in a claim, as is interpretation of the claim as a whole, is a question of law. *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1579-80, 12 USPQ2d 1382, 1385-86 (Fed. Cir. 1989).

Footnote 8. After discussing the dictionary definitions, the first of which was "identical in all essentials or respects," the court said "[i]n the context of precise scientific applications, 'corresponding' means as close to identical as is technically possible." *Hormone Research v. Genentech*, 708 F.Supp. at 1101, 8 USPQ2d at 1381.

Footnote 9. HRF urges that the prosecution history of a claim not in suit cannot estop use of the doctrine of equivalents for claims that are in suit. This argument has no merit where, as here, the remarks specifically discuss the intended scope of claim 12 of the '833 patent, one of the claims allegedly infringed by Genentech. HRF also argues that the statements forming the estoppel here were made after the examiner indicated that the claims in suit were allowable. We agree with the district court, however, that these circumstances do not automatically preclude application of prosecution history estoppel.

Footnote 10. Section 102(b) states:

A person shall be entitled to a patent unless-

....

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States[.]

Footnote 11. For correctness, we note this court's recent discussion concerning the doctrine of equivalents vis-a-vis the scope of allegedly infringed claims in *Wilson Sporting Goods Co. v. Geoffrey and Assocs.*, Appeal Nos. 89-1554, -1555, slip op. at 14-15 [ 14 USPQ2d 1942 ] (Fed. Cir. May 23, 1990). As the *Wilson* court stated, "the doctrine of equivalents does not involve expansion of the *claims,* " but an expansion of the "right to exclude," *see* 35 U.S.C. §271 (1988), to include "equivalents" of what is claimed. *Wilson,* slip op. at 14-15.

Footnote 12. It should be noted that there is also ambiguity as to whether the synthetic hormone distinction on which HRF bases its argument may have been abandoned during prosecution. This distinction was expressed in response to the examiner's first rejection based on Bewley, then rejected by the examiner and not pursued further.

Footnote 13. We express no opinion as to the legal soundness of this or the other suggested interpretations of Dr. Li's arguments. At this stage of the proceeding, it is only necessary to ascertain whether there are factual questions as to Dr. Li's interpretation of the cited prior art.

Footnote 14. If the court determines that estoppel does not apply, it should then determine whether Genentech's products are within a legally permissible range of equivalents. *See Wilson Sporting Goods Co. v. Geoffrey,* Appeal Nos. 89-1554, -1555 (Fed. Cir. May 23, 1990).

Footnote 15. The district court, in rejecting one of Genentech's lack of enablement arguments as to claims 1 and 18 (which refer to the sequence of natural HGH rather than to Figure 2) interpreted these claims more broadly than "Figure 2" claims. The '833 specification, however, does not support the broader claim construction. In the specification, Dr. Li stated that "[t]he correct formula of natural HGH is depicted in Fig. 2 of the drawings." Moreover, HRF concedes in its brief on appeal that "Dr. Li used 'Fig. 2' synonymously with 'HGH' throughout the application ..., believing the sequence of Fig. 2 to be that of the natural HGH protein." Under these circumstances, the phrase "sequence of natural human pituitary growth hormone" appearing in claims 1 and 18 must be construed as being limited to a hormone having the structure of Figure 2 of the '833 patent, which was later discovered not to be the same as natural HGH.

The doctrine of claim differentiation, *see, e.g., Yarway Corp. v. Eur-Control USA, Inc.*, 775 F.2d 268, 274-75, 227 USPQ 352, 356 (Fed. Cir. 1985), does not require a different conclusion. That doctrine, although well-established in our cases, cannot overshadow the express and contrary intentions of the patent draftsman. It is not unusual that separate claims may define the invention using different terminology, especially where (as here) independent claims are involved. *See Tandon Corp. v. United States Int'l Trade Comm'n*, 831 F.2d 1017, 1023-24, 4 USPQ2d 1283, 1288 (Fed. Cir. 1987).

**- End of Case -**